Disa virginalis (Diseae: Orchidoideae: Orchidaceae): A New Species from Southern Africa

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ABSTRACT. A new species of *Disa*, the largest genus of terrestrial orchids in southern Africa, is described from the Western Cape. *Disa virginalis*, sp. nov., was previously included in *D. maculata*, but is white rather than blue, with shorter and broader lateral sepals, and a less developed spur. In addition, the galea is narrowed in front. Similarities to *D. schizodioides* are also discussed; these indicate that the current sectional classification of subgenus *Disa* may not be correct.

Disa P. J. Bergius, with ca. 130 species, is the largest genus in the subtribe Disinae. The three other genera in the subtribe, *Monadenia* Lindley, *Herschelianthe* Rauschert, and *Schizodium* Lindley, each has less than 20 species. *Disa* is widespread in the cooler parts of Africa. The majority of the species are found in the mountains and on the coastal flats of the southwestern tip of South Africa, and the genus is also common in the montane grasslands from the Drakensberg northward to Ethiopia and westward to Liberia. A single species is found in Yemen (Linder, 1983). The generic delimitation of the genus remains contentious, and it is possible that the satellite genera *Herschelianthe* and *Monadenia* should be included within *Disa* (Linder & Kurzweil, 1994). Although Linder (1981) published a detailed subgeneric classification for *Disa*, many of the sections and subgenera may not be monophyletic, and so need further evaluation (Linder, 1986; Linder & Kurzweil, 1990).

With the increasing interest in the relationship between pollinators and floral morphology, much research has been done on the Disas (Johnson, 1994, 1995a, 1995b, 1995c; Johnson & Linder, 1995), and this interest has led to the discovery of several new species, one of which is described here.

Disa virginalis H. P. Linder, sp. nov. TYPE: South Africa. Western Cape: Groot Winterhoek Forest Reserve, on dry rock ledges, *Linder 6598* (holotype, BOL). Figure 1.

A *Disa maculata* L.f. floribus parvis albis et petalis brevibus latis, a *D. schizodioides* Sonder lobis basalibus petalorum expansis et labiis aequantibus sepala recedit.

Plants small, herbaceous, perennating by narrowly ovate testicular tuberoids to 1 mm long. *Leaves* dimorphic: basal leaves green, 3–6, linear-oblanceolate, to 40 × 4 mm, acute to finely apiculate, the margins sometimes red, the upper subcauline with a purple-dotted sheath; cauline leaves reduced to membranous, brown-veined, to 15 mm long, acute sheaths, grading into the bract. *Flower* solitary, not resupinated, white except for vertical purple barring on the petal blades and a green galea sac, not scented. Ovary 10–20 long, exceeding the bract. Lateral sepals spreading, obovate, obtuse, obscurely apiculate, 10–17 × 8–15 mm. Dorsal sepal galeate, triangular in side view, laterally compressed, the apex attenuated, acute, somewhat reflexed, the back acute but without a developed spur, galea 10–15 mm tall and 4–6 mm deep, the entrance 3–5 mm wide. Petal limbs reflexed along the base of the galea, 4–6 × 1 mm; terminal blades obovate, ca. 5 × 3 mm, obtuse, upcurved geniculately behind the anther and twisted to face forward. Lip spreading, lorate to lorate-oblanceolate, acute, flat, 10–15 × 4–6 mm. Anther reflexed parallel to the petal limbs, 2.5 mm long, caudicles short and sharply upcurved. Rostellum equally three-lobed, 2 mm tall, robust, with the viscidia facing upward. Stigma small, horizontal, tripulvinate.

Ecology and distribution. There are only three known populations of *Disa virginalis*, and these are all geographically rather isolated. The species is restricted to south-facing rock ledges at ca. 1000 m. It does not appear to be essential that there is any water seepage: the habitat can thus be described as cool and dry. The plants occur in dense clusters, suggesting some form of vegetative reproduction, although there are no obvious means for

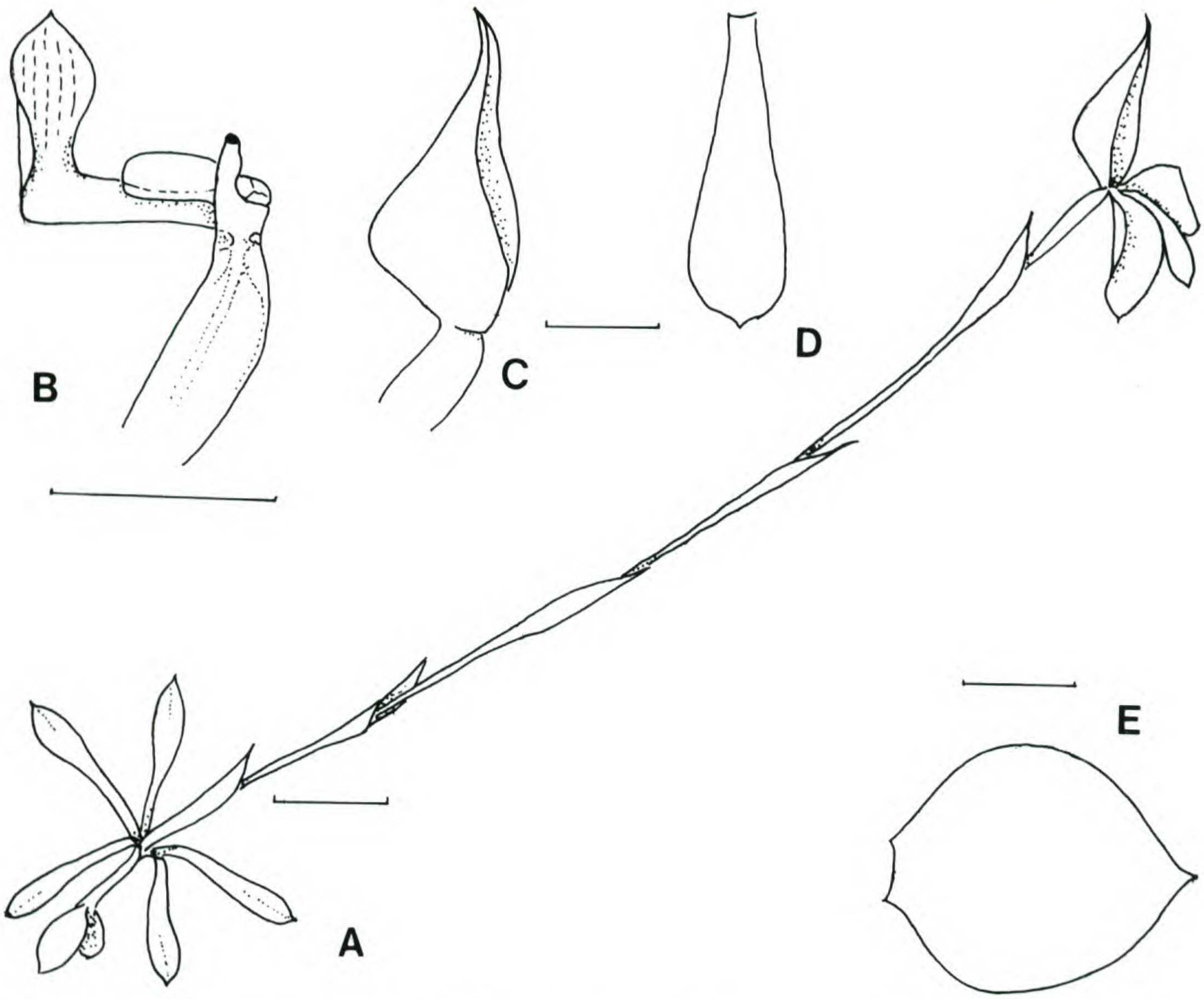

Figure 1. *Disa virginalis* H. P. Linder. —A. Flowering plant. —B. Gynostemium with one petal removed, showing petal reflexed next to reflexed anther, erect rostellum, and tripulvinate stigma; viscidium in black. —C. Dorsal sepal in side view. —D. Lip. —E. Lateral sepal. Scale bars: A = 10 mm, all others 5 mm. All from *Linder 6598.*

this. Flowering occurs during October, sometimes reaching into the beginning of November.

This species should be regarded as rare. Although all three populations are relatively protected, the small number of populations render the species vulnerable.

Etymology. The species epithet refers to the pure white flowers.

This new species was previously included in *Disa maculata* L.f. Linder (1981) regarded it as recessive form of *D. maculata.* However, he could not have studied collections of these white-flowered populations because he noted "There is almost no structural variation in this species." Although *D. virginalis* is clearly closely related to *D. maculata,* it differs as follows:

The lateral sepals are relatively wider. There is substantial variation in the sepal width in *D. maculata,* but they are never as wide as in *D. virginalis.* This has a profound impact on the appearance of the flowers because in *D. virginalis* the lateral sepals and lip overlap to form an extensive continuous expanse of tissue.

The base of the galea is shorter, and consequently the petal limbs, which lie along the base of the galea, are also shorter. As a result, the galea of *D. virginalis* is shallower than that of *D. maculata.*

The entrance to the galea is wide open in *D. maculata* but is laterally compressed in *D. virginalis.* This is not evident on preserved material, where the flowers are either flattened or to some extent collapsed.

The flowers are white, rather than blue. Eric H. Harley reported (pers. comm.) the presence of apparently recessive, white individuals from the Cape Peninsula population of the blue *D. maculata,* but they have none of the morphological features of *D. virginalis,* thus indicating that the morphological features of *D. virginalis* are not pleiotrophic effects of a recessive color change.

The habitats of the two species are subtly different. Although both are rock-ledge species, *D. ma-*

culata appears to grow on ledges that receive some moisture through seepages or drips and consequently is generally found in moss beds and among other ledge vegetation. Although some plants of *D. virginalis* may be found in moss beds, the majority grow on ledges and in cracks too dry for moss. Although the distribution ranges of the two species overlap, there may be only partial ecological overlap.

Disa virginalis shares many similarities with *D. schizodioides* Sonder. Both are small rock-ledge species, with radical leaves and solitary white flowers. The sepals and rostellum structures of the two species are virtually identical, and they differ largely in their petal and lip shapes. The petals of *D. schizodioides* have small erect blades, while the basal limbs are much more substantial. The lip is also much shorter, broader, and abbreviated. The two species are geographically isolated; *D. schizodioides* is a southern Cape species, found in the Langeberg and the Swartberg, which receive substantial summer rain, while *D. virginalis* is found in the mountains of the southwestern Cape, which receive almost no summer rain.

Linder (1981) grouped *Disa maculata* with *D. longicornu* in *Disa* subg. *Disa* sect. *Phlebidia* on the shared possession of basal leaves, dry leaf-sheaths, single blue flowers, and petal structure. Although *D. virginalis* has some of these characteristics, it has white flowers and shows close similarities to *D. schizodioides*, which is in section *Disa*. Yet there appears little doubt that it also has close similarities to *D. maculata*. No cladistic analysis of *Disa* subg. *Disa* is yet available, but it would appear that *D. maculata*, *D. virginalis*, and *D. schizodioides* form a natural group within this subgenus. This questions the usefulness of section *Phlebidia*, unless it is defined to include only *D. longicornu*. *Disa longicornu* is a rather peculiar species within subgenus *Disa*, where its long spur and the petal extensions are unique. It would not appear advisable at this stage to pronounce on the correct sectional taxonomy within subgenus *Disa*: this will have to await a phylogenetic analysis.

Paratypes. SOUTH AFRICA. **Western Cape:** Bainskloof, Limietberg, 18 Oct. 1966, *Oliver s.n.* (BOL); SE ridge of Bailey's Peak, 15 Nov. 1975, *Esterhuysen 34099* (BOL); Piketberg, seaside of summit of Kapteinskloof Mt., 21 Oct. 1945, *Pillans 7743* (BOL); Piketberg, SE slopes of Zebrakop, 9 Nov. 1934, *Pillans 7347* (BOL).

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